

*ANALOGUE FUNCTIONAL ANALYSIS OF  
MOVEMENTS ASSOCIATED WITH TARDIVE DYSKINESIA*

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We studied whether movements associated with tardive dyskinesia (TD) served operant functions in 2 men with developmental disabilities. We found that TD-related movements occurred more frequently in the alone and attention conditions and less frequently in control and demand conditions. Our findings suggest that TD-related movements may not be maintained by social reinforcers and that decreases in TD movements are possibly a result of engagement in activities that are incompatible with TD movements.

DESCRIPTORS: analogue functional analysis, developmental disabilities, tardive dyskinesia

Tardive dyskinesia (TD) involves involuntary movements of the face, trunk, or extremities that result from taking antipsychotic medication. Studies report that 20% to 48% of people with developmental disabilities show signs of TD (Golden, 1988; Sprague, van Emmerik, Slobounov, & Newell, 1995; Stone, May, Alvarez, & Ellman, 1989). This is a concern because TD movements can substantially interfere with daily activities, such as working, dressing, and eating.

Currently, no successful treatments for TD movements have been identified (Newell, Wszola, Sprague, Mahorney, & Bodfish, 2001). In addition, although interventions for TD have been evaluated, no research has been conducted to determine if movements associated with TD have an operant function. Functional analysis methodology has been used recently to assess whether operant rein-

forcers maintain a variety of aberrant responses (see Hanley, Iwata, & McCord, 2003, for a review). In this study, we conducted functional analysis to evaluate whether TD movements were under the control of social reinforcers.

## METHOD

*Participants and setting.* Two men who had been diagnosed with mild mental retardation participated. Both participants had received antipsychotic medication in the past and had been diagnosed with TD. Keith was a 53-year-old African-American man who was taking 10 mg of olanzapine. John was a 52-year-old African-American man who was taking 600 mg of clozapine and 2 mg of benztropine. All sessions were conducted in a quiet room with a table and chairs.

*Responses, measurement, and interobserver agreement.* Keith's TD movements included face and lip puckering, grimacing, blinking, shoulder twitches, and ankle flexion. John's TD movements included shoulder torsion, athetoid-myokymic fingers, pill rolling, ankle flexion, blinking, and lip puckering. A 10-s partial-interval paper-and-pencil system was used to score occurrences of TD movements from videotaped sessions. Interobserver agreement was calculated by dividing the

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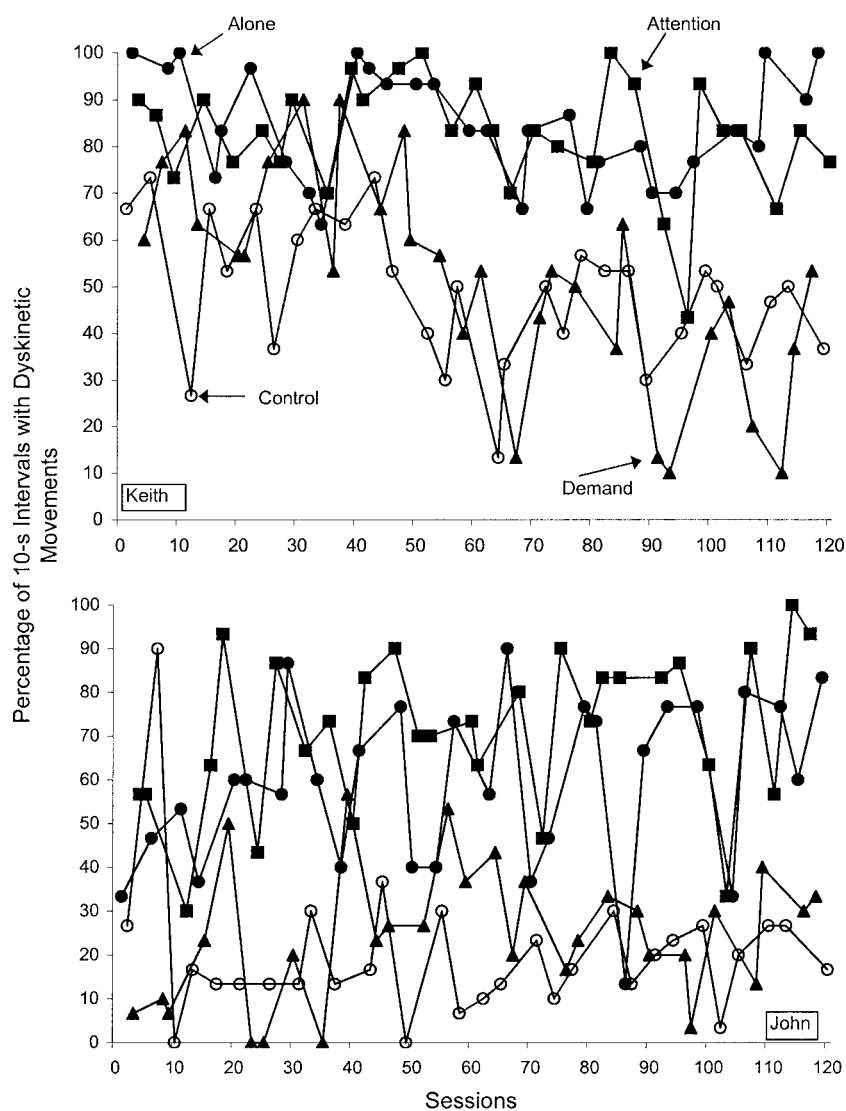


Figure 1. Percentage of 10-s intervals of dyskinetic movements during analogue functional analyses for Keith (top panel) and John (bottom panel).

number of agreements (occurrence and non-occurrence) by agreements plus disagreements and multiplying by 100%. Interobserver agreement was obtained for 33% of all sessions. Average agreement for Keith was 91% (range, 84% to 99%) and 98% for John (range, 87% to 100%).

**Procedure.** Analogue functional analyses involving alone, attention, control, and demand conditions were conducted using a multielement design. Sessions, consisting of

four conditions, were conducted once per day for Keith and once per week for John. Each condition was 5 min long with a 1-min break between conditions. All contingent events were for TD movements.

In the alone condition, the participant was in a room without any preferred activities or social stimulation, and no consequences were delivered for TD movements. During the attention condition, the researcher withheld social interaction unless

the participant engaged in TD movements, in which case the researcher provided attention in the form of a social comment (e.g., "it's a nice day today"). During the control condition, the participant had access to attention and preferred activities (e.g., looking at books and magazines). In the demand condition, the researcher presented the participant with demands that required the use of his hands (e.g., stacking cups, folding towels, sorting cards by color, or opening tins) and prompted active engagement with the items. If the participant completed the task, he was praised and presented with another task. If he engaged in TD movements, the researcher removed the materials for 15 s before presenting a new task.

## RESULTS AND DISCUSSION

During the analogue functional analysis, the highest percentage of dyskinetic movements occurred during the alone and attention conditions for Keith and John (see Figure 1). In contrast, levels of dyskinetic movements were lower during the demand and control conditions for both participants. Results suggest that social reinforcers did not maintain the TD movements displayed by these 2 participants. Rather, a plausible explanation is that the engagement in motor tasks presented during the demand and control conditions may have been incompatible with engagement in TD movements. In the alone and attention conditions, no activities

were presented that required alternative competing responses to TD movements.

In future studies of behaviors involving limb movement, researchers may want to consider whether the differential motor activity requirements among conditions may influence the outcomes of the analysis. In this study, decreased levels of TD movements were observed during all sessions that required limb movement. Results also suggest that providing activities that require movements of the affected limbs to individuals with TD may decrease TD movements.

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